Some Points in Practical Surgery suggested by the Study of the Life and Work of John Hunter

BEING THE HUNTERIAN LECTURE DELIVERED BEFORE THE HUNTERIAN SOCIETY OF LONDON, FEBRUARY 26, 1902

BY

REGINALD HARRISON, F.R.C.S.

Member of Council, Vice-President (1894-95), *and Hunterian Professor of Pathology and Surgery* (1891) *Royal College of Surgeons; Surgeon to St. Peter's Hospital*

London

JOHN BALE, SONS & DANIELSSON, LTD.

OXFORD HOUSE

83-89, GREAT TITCHFIELD STREET, OXFORD STREET, W.

1902

Some Points in Practical Surgery suggested by the Study of the Life and Work of John Hunter.

Being the Hunterian Lecture delivered before the Hunterian Society of London, February 26, 1902.

By REGINALD HARRISON, F.R.C.S.

Mr. President, when your predecessor asked me to deliver the Hunterian Lecture this year, I felt less diffidence in accepting the honour than I should otherwise have done, because I knew that your Society had never ceased to show its reverence for the illustrious man whose name it bears, in the most practical and useful forms.

Thus I ventured to hope that, though unable to do justice to the memory of Hunter in fitting or adequate terms of oratory, I might, as a humble follower of the founder of scientific surgery, pay a modest tribute to the far-reaching application of his example and teaching, and to their undying influence on our practice and progress.

I am taking for my subject some points in practical surgery suggested by a study of the life and work of John Hunter.[1] It would be difficult to find a more agreeable or improving occupation than that of recognising and tracing how much we are indebted to him for the

---

[1] "John Hunter: Works, with Notes," edited by Palmer, 1835.

rapid strides our art has made in almost every direction. Though Hunter did not give us anæsthetics or antiseptics, he prepared surgery, by placing it on a scientific basis, for the reception of these two grand discoveries of this age.

Upon the subject of hydrocele Hunter writes: "I believe I am the first who has taught that the radical cure is performed by inflammation, suppuration, and granulation. The most simple mode recommended for obliterating the cavity consists in making a small opening into the sac, and introducing an extraneous body to prevent union by the first intention." Hunter does not refer to the injecting of fluids in this place, such as alcohol or other stimulants, but to the introduction and retention of what he speaks of as "a tent," which "gives the alarm to the whole cavity," and thus secures healing by granulation.

Tapping and injecting with a strong solution of iodine, like the Edinburgh tincture, has advantages, but it is extremely painful, and often sets up an inordinate and prolonged inflammatory tension, which in some instances, I believe, is detrimental to the testicle, as happens occasionally in acute orchitis. Thus the gland may be rendered sterile, as the late Mr. Henry Smith pointed out some years ago.

Again, injection with iodine occasionally fails to effect a radical cure by reason of the extreme thickness of the sac, or the latter may be so capacious as to render it unsafe to excite an acute inflammation in this way in a confined area. Double hydroceles are not very common. Where a single hydrocele is tapped and injected, though the inflammation resulting may be very intense and damaging to the testicle, yet by reason of the opposite organ the power of procreation is not likely to be interfered with.

On grounds such as these some surgeons have more recently advocated the adoption of Hunter's method of

incising and opening the sac, and substituting a drainage-tube with antiseptic dressings for a solid tent, after tapping has failed to effect a cure. This plan has much to recommend it. It is painless after the anæsthetic has passed off, there is less risk of failure and damage to the testicle, and it makes little difference in the time occupied by the cure as compared with tapping and injecting iodine.

I adopted this method some years ago where I had to perform the radical cure for a recurring hydrocele in a middle-aged man with a single testis in the scrotum, who was contemplating marriage. For the reason mentioned I was unwilling to inject iodine or any other less certain irritant for fear of spoiling the solitary testis. The operation was successful and the union fruitful. Where the sac is thick and leathery, I sometimes cut out with scissors an elliptical portion of it on either side of the incision. I find this serves as well as removing the entire sac and considerably lessens the extent of the operation. In some cases of bilateral hydrocele with very thick sacs which had been tapped and injected frequently with iodine or carbolic acid, this method answered extremely well and was followed by permanent cures.

Hunter's observations on perineal urinary fistula are interesting. He says: "In whatever part of the urethra the disease is, the external opening seldom heals as long as the seat of the disease has no disposition to heal. Let us compare this disease (urinary fistula) with the state of parts after lithotomy. If the incision is made in sound parts, and the whole injury be a stone which is extracted, the parts readily heal in spite of the urine passing through that channel. This, then, shows that there is another cause of their not healing." Further he states: "To cure this disease it is necessary first to make the natural

passage as free as possible, that no obstruction may arise from that quarter—and sometimes this alone is sufficient—for the urine finding a free passage forwards, is not forced into the orifice and the fistula heals up. But the dilatation of the stricture is not always sufficient; it is often necessary to perform an operation on the fistulæ when they alone become the obstacle to the cure."

Here we have in a few lines the pathology and treatment of urinary fistula with a reservation for exceptional or complicated cases. There can be no doubt that in the larger proportion of cases where a stricture of the urethra co-exists with a urinary fistula, or is the cause of it, the removal of the stricture by some form of dilatation, with or without the retention of a catheter, as Hunter suggests, is sufficient in itself to effect a cure of the fistula, and so long as the patient is careful in keeping the stricture dilated such a consequence is not likely to recur.

But this consideration by no means covers the whole ground. Water or urine will invariably escape through the easiest channel. Cases are frequently met with where it has thus been found impossible to heal up these sinuses, even though the stricture has been fully dilated. This would seem to imply that either owing to a state of urethral spasm, to which persons are more liable who have had obstructions of this kind, or, as Hunter suggests, to the precise manner in which the false routes communicate with the urethra, it is impossible to prevent some urine entering them during the voluntary act of micturition. Either of these reasons is sufficient to explain this difficulty in closing a fistula.

Then arises the question, What more can be done to bring about a closure of these fistulæ? for nothing can be more intolerable to a patient than having to go about with a leaking and discharging sinus that fails to heal. Hunter's

reference to the making of wounds which "readily heal in spite of urine passing through them," to use his own words, has an important bearing upon this point, for it will be recognised that their substitution for those which show no tendency to repair, but, on the contrary, to remain patent as suppurating and offensive sores, may often be advantageously utilised.

This point has frequently been demonstrated in practice, and proved the quickest and safest way of dealing with certain forms of urethral stricture complicated with one or more urinary fistulæ. Thus the secondary proceedings to which Hunter refers, namely, operations on the fistulæ themselves, may be obviated as unnecessary when the stricture is entirely freed and the urine so efficiently drained as to be prevented entering unnatural channels.

I will take a case in illustration, not because the principle is unrecognised in practice, but for the reason that there are at least two points which are paramount that I would like to emphasise.

The case is that of a man recently under observation, aged 25. His condition is outlined in the diagram, which is introduced for the convenience of description. It will be seen (fig. 1) that there is a stricture in the deep urethra, and in addition no less than five fistulæ opening externally, and directly or indirectly communicating with the urine passage immediately behind the point of obstruction. One fistula opens on the lowest part of the abdomen in front, another passes through the scrotum, whilst the openings of three will be found in the perineum. Under the act of micturition urine was expelled through all of them in addition to some suppuration, which was continuous. The cause of this trouble was a traumatic stricture of the urethra, which supervened upon an injury to this part, and the unhealed abscesses that had arisen out of this.

For the stricture and fistulæ, for something like eighteen months, many varieties of treatment were adopted, having for their object the cure of the stricture and the healing of the fistulæ, but without any avail. Dilatation with bougies, the retention of a catheter, and the scraping and slitting up of the fistulæ had all been practised, but

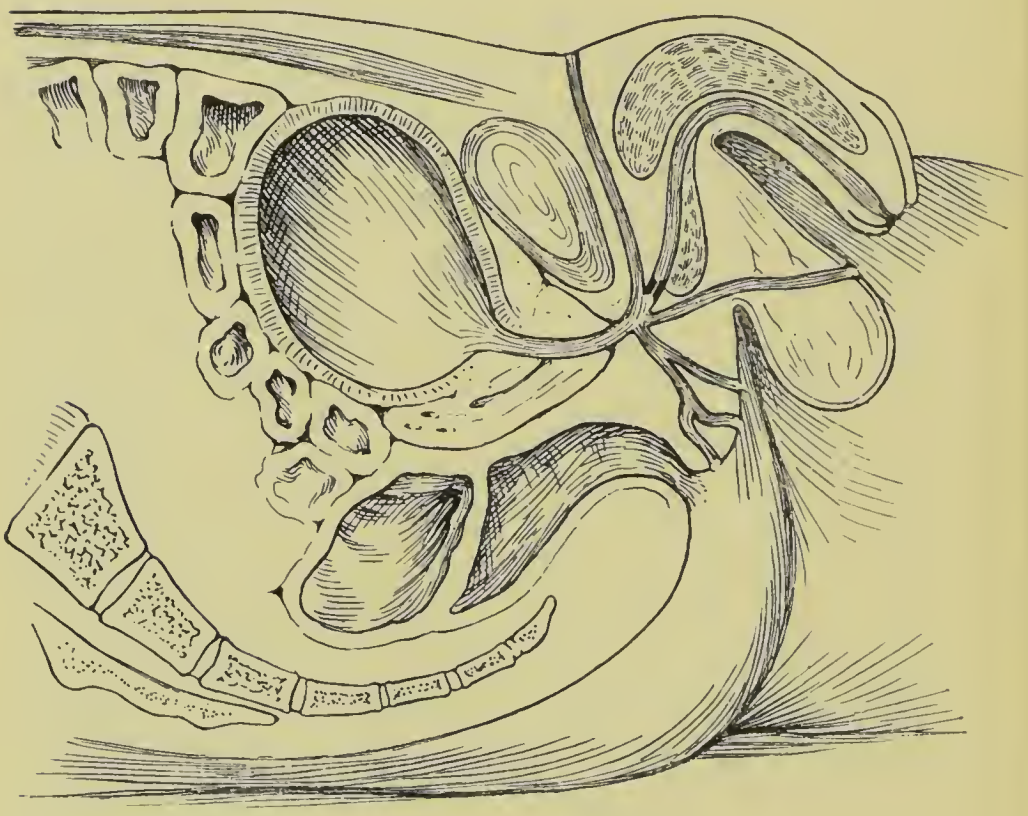

Fig. 1.

without leading to any permanent good. Hardly any urine escaped in the natural way, but under severe spasm a little was occasionally forced through the stricture, and was sufficient to indicate that the normal passage was not obliterated, as might have been anticipated. Without going into details, these fistulæ were all soundly healed within a month by means of an external urethrotomy or

perineal section, with proper provision for what Hunter speaks of as a "free passage forwards" for the urine, or in other words, for drainage.

And it is upon the two governing principles as laid down by Hunter in the passage quoted, as being generally applicable to this class of cases, that I would desire to lay stress. These are (1) the necessity for securing a free outlet forwards for the urine, and (2) the provision of a wound when required for this purpose, which will, as Hunter states, "readily heal in spite of urine passing through it."

I have already observed that in dealing with the expulsion of urine from the bladder it must be remembered its course is entirely determined by the degree of resistance that is opposed to it. If this is less in the case of a false or an unnatural route, it is certain to select this in preference to the natural channel, whatever may be the condition of the latter. Hence to divert the urine from these fistulous openings, and cause them to dry up and heal from want of use, it is a first principle to secure its escape by the natural channel, or if the latter is permanently damaged, by a substitute.

In the matter of urine-drainage much depends on the nature and position of the wound that is made for this purpose. We see this, for instance, in the case of wounds made for median lithotomy as compared with those made for a lateral lithotomy. The former will not drain thoroughly and incontinently without a suitable drain-pipe or other apparatus. The latter is entirely independent of all kinds of apparatus, and the drainage will be free and incontinent until repair has made considerable progress. I do not think sufficient has been made of this distinction.

In the days which preceded the more general adoption

of lithotrity it was not uncommon to see co-existing urinary fistulæ complicating vesical stone heal quickly and kindly after lateral lithotomy, where the urine-drainage was free and incontinent. The fistulæ were thus never used for discharging urine, which escaped far more readily through the incision, and consequently closed spontaneously before the lithotomy wound had time to heal. This was not the case, or rarely so, when such sinuses complicated a case where median lithotomy was selected; for by reason of the very imperfect and casual drainage the latter permitted, as compared with the former, the median incision into the urethra would close first, and leave the discharging urinary fistulæ *in statu quo*.

The incision for lateral lithotomy, by reason of the free and incontinent drainage it affords to the urine, has, I believe, in more than one instance in bygone days, averted death from rupture of the urinary bladder by reason of its giving an easier vent for the urine outwards than in the opposite direction towards the peritoneal cavity. Mr. Rivington also draws attention to this point.[1]

Some years ago I remember a man who had sustained an extensive fracture of the pelvis and a ruptured bladder by a heavy case of goods falling upon him in the hold of a ship. He lived for some days, and did not die from his bladder injuries, for the reason, I believe, that I had opened the bladder by an incision as for lateral lithotomy to allow of his urine escaping involuntarily, as the perineum was much damaged. This was some years before anything had been done in the way of suturing a ruptured bladder in these circumstances.

Hence care must be taken to remember this distinction between these two kinds of wounds. If a median urethro-

[1] "Rupture of the Urinary Bladder," p. 81.

tomy is selected as a substitute for a temporarily damaged urethra, we must see that it is provided with the means for efficient drainage, otherwise the urine is sure to make its way into the fistulæ and prevent them healing. In such cases an incompressible drainage-tube should in the first instance be used, though a soft one may afterwards be substituted when the new channel is fairly formed.[1]

Speaking of their application to urinary fistulæ, bladder drainage-tubes ought to fit with the accuracy and uninterrupted action of a tracheotomy tube. They should, if necessary, be adjusted with sutures so as to prevent any side leakage, and the measure of the index finger may serve as an indication for the size of the tube. It should be remembered that one tube will not fit every one any more than one shoe will. In the last place, it should not be finally withdrawn until all the fistulæ are soundly healed.

The wound made for the purposes of urine drainage as I have illustrated in connection with these fistulæ, should be, as Hunter states, one "that will readily heal in spite of urine passing through it." This is quite as attainable as that of securing perfect drainage, provided that pains are taken to bring this about.

Some surgeons seem to have a sort of dread of opening the urethra unless, as it were, they find themselves surrounded by certain horns of a dilemma from which there is no escape. I cannot say I share this feeling, though I should be sorry to open the urethra without ample reason.

My recollections of opening the urethra go back to the time before litholapaxy was invented, that is to say, prior to 1878. We opened the urethra in the median line to explore the bladder digitally and to take stones out of it

[1] "Selected Papers on Stone. Prostate, and other Urinary Disorders," by Reginald Harrison. P. 173. London: Churchill, 1899.

more frequently than we do now. It rarely happened that a urinary fistula was the result.

Whenever I met with such an accident I took some pains to ascertain how it had happened. It was unreasonable to suppose that there was no explanation for this in the face of its rarity. Thus it occurred to me to enquire whether the fistula had any obvious relation with what had gone into the bladder, or with what came out

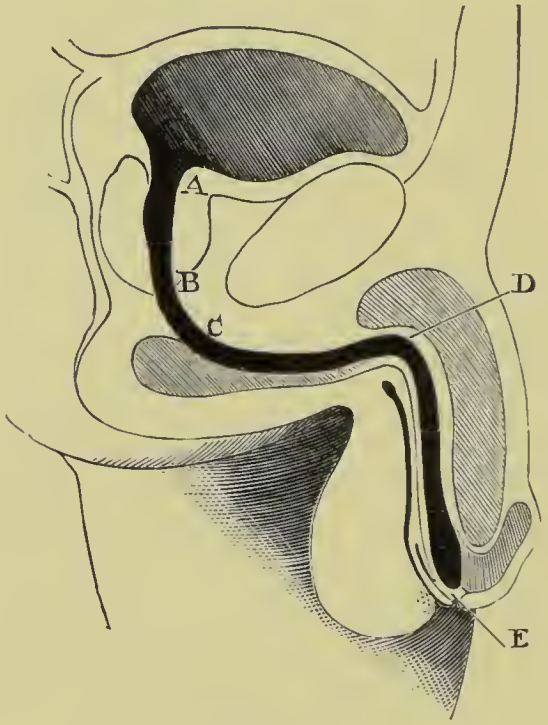

Fig. 2.

of it. Was it due to the method of operating or to some disordered state of the bladder or urine, which rendered healing abortive?

I came to the conclusion that it was the former. Because, if the perineal incision opened the urethra immediately in front of the prostate and within the horizontal portion of the urethra (fig. 2, B—C), as the patient was in

the recumbent position, it seemed impossible to prevent the wound healing when required ; whereas if the wound was made anterior to this point in the vertical portion of the canal (fig. 2, C, D) as marked in the figure, it was the reverse, healing was indefinitely postponed. This deduction admitted of easy proof, for assuming the opening to be in the median line of the perineum, though in the vertical portion of the urethra, all that was necessary to secure healing of such a fistula was with a probe-pointed knife to extend the incision in a downward direction so as to throw the lower angle of the wound into the horizontal portion of the urethra as the patient lay in the recumbent position. Since I made this observation I have never troubled myself about opening the urethra when I thought it necessary either for the treatment of a stricture or the obliteration of a fistula, and other surgeons have verified this point.

Thus I have endeavoured to illustrate and give prominence to Hunter's teaching, that to cure urinary fistulæ it is necessary to provide for the urine "a free passage forwards" and an opening "that will readily heal in spite of the urine passing through it."

Hunter thus writes on vesical bleeding. "I have known cases where the common catheter has been pushed through the projecting part of the gland into the bladder, and the water then drawn off; but in one patient the blood from the wound passed into the bladder and increased the quantity of matter in it. I passed the catheter till it came to the stop, and then suspecting that this part of the prostate projected forwards, I introduced my finger into the anus and found that gland very much enlarged. By depressing the handle of the catheter, which of course raised the point, it passed over the projection, but unfortunately the blood had coagulated in the bladder, which filled up the holes in the catheter, so that I was obliged to withdraw it and

clear it repeatedly. This I practised several days, but suspecting that the coagulum must in the end kill, I proposed cutting him as if for the stone; but he died before it could be conveniently done, and the dissection after death explained the case to be what I have now described."

These remarks are of much value. We know the difficulty in emptying an atonic bladder, when distended with blood clots, with an ordinary catheter and syringe. In an instance I have recorded[1] of a man, aged 72, with an enlarged prostate, it was found impossible to do so in the ordinary way. Even with a large-eyed evacuating catheter and a powerful aspirator for removing stone fragments from the bladder, this could not be accomplished until I had first broken up the clots with a lithotrite, under an anæsthetic. In this way a large basinful of disintegrated blood with urine was withdrawn. A rubber catheter was tied into the bladder, as the latter had been distended fully up to the umbilicus. The administration of ergot appeared to check further bleeding, and the patient made a good recovery, though he remained more or less dependent on his catheter. Ergot will often contract a bladder as it does a uterus. It was suggested that the bleeding in this instance had been caused by a catheter. I do not think this was so. I have seen many cases where old men apparently bled into their bladders instead of into their brains. I refer to instances of vesical apoplexy which are not uncommon. In this way arterial tension is, I believe, sometimes suddenly lessened. In an instance of a man, now living, aged 77, whom I have known for some years, his life appears to have been prolonged by this less dangerous substitute for cerebral bleeding.

---

[1] "Selected Papers."

Going back to Hunter's case, relative to the blood clotting, and the difficulty of dealing with it by the catheter, he observes: "As the clot must in the end kill, I proposed cutting him as for the stone, but he died before it could be done." This is a suggested procedure which may occasionally be adopted with advantage. In fact, in the two following cases no other course was open, and its prompt adoption not only in all probability saved the lives of these individuals, but placed them in a much better position than they were prior to the accident which necessitated this.

The first instance was that of a man who was suffering from an enlarged prostate. I was asked to see him by the late Dr. James Long, of Liverpool, under the following circumstances. Six days previously a large metallic prostatic catheter had been passed for him with difficulty. This had occasioned great pain and hæmorrhage at the time, and subsequently so much so that when I saw him he was blanched from loss of blood. The bladder was much distended with urine and clots. I performed a median perineal urethrotomy, and my finger, on its way into the bladder, passed through a hole at the base of what appeared to be the greatly enlarged middle lobe, which I concluded had been made by the prostatic catheter (fig. 3). Under the pressure of my finger a bridge of sloughing prostatic tissue broke down, which was removed, thus rendering the opening leading into the bladder completely free. The bladder was washed out and freed from clots and slough, and a large tampon drainage-tube introduced and secured. No further bleeding occurred, and clear urine escaped from the tube, which was retained for a week, when a fresh one was substituted. The patient made a good recovery in every respect, and his prostate gave him no further trouble. By the damage

done with the catheter and the sloughing that followed the obstructing portion of the prostate was so completely removed that I was not surprised at this good result. Some time ago I heard of his death from old age, without any return of his urinary troubles.

Hæmorrhage into the bladder in younger persons suffering from stricture with enfeebled expulsive power or atony sometimes requires treatment in the manner that

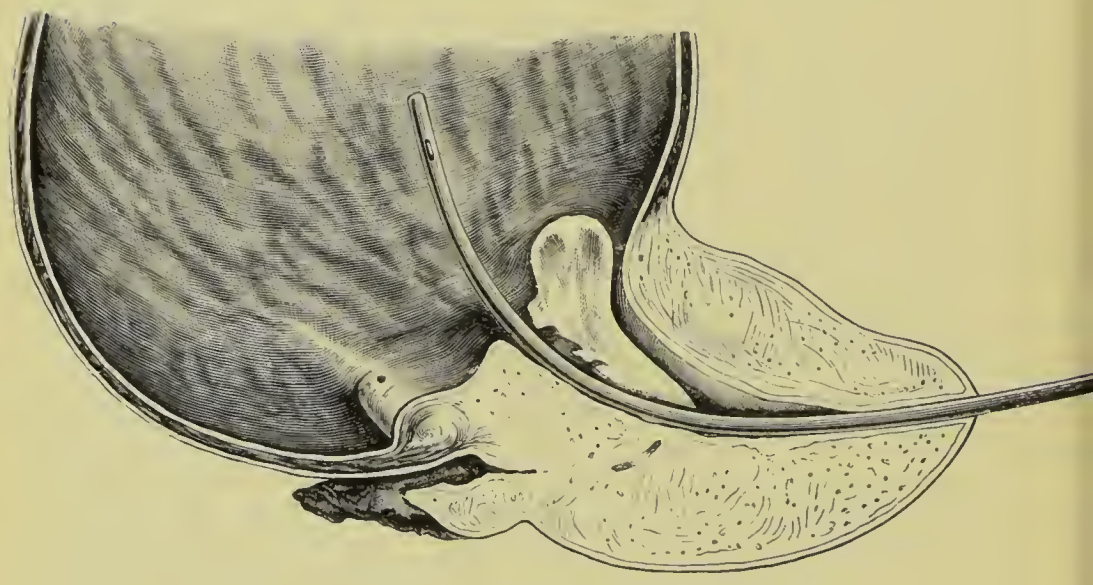

Fig. 3.

Hunter suggested. In these cases the perineal route should be selected, so that the stricture and the bleeding may be dealt with at the same time. The following case of a more recent date illustrates this :—

A man, aged 47, came under notice at the hospital in November, 1898. For some weeks he had been in attendance as an out-patient for the purpose of having a stricture in the deep urethra dilated. On the day in question a No. 7 flexible bougie was passed, and a little bleeding followed. In the evening he returned to the

hospital with full retention. The bladder was emptied of blood and urine with a catheter and a small lithotrity aspirator. On the following day the amount of distension and pain was as much as before.

As the bleeding was unchecked and proceeded from the strictured portion of the deep urethra, I performed a perineal section, and also divided the stricture. A large gum-elastic incompressible drainage-tube was then passed into the bladder, and about two pints of clots, blood, and urine, were evacuated. The tube was removed in seven days, and the patient left the hospital in three weeks with the wound soundly healed. His stricture has been greatly benefited, and he now has a full-sized bougie passed when he applies as an out-patient. As in Hunter's case, these clots would probably have killed had they not been removed.

Hunter had a good deal to say in reference to catheters and their uses. In fact, we may trace various forms of instruments at present in vogue as emanating from him. In some of his observations on the altered direction of the urethra which the enlarged prostate brings about, we may recognise, for instance, the origin of the coudée catheter, though I believe it is commonly associated with the name of the French surgeon, Mercier.

Hunter says, when speaking of the effects of enlargement of the lateral lobes of the prostate: "A small portion of it, which lies behind the very beginning of the urethra, swells forward like a point as it were into the bladder, acting like a valve to the mouth of the urethra. It sometimes increases so much as to form a tumour, projecting into the bladder some inches. This projection turns or bends the urethra forwards, becoming an obstruction to the passage of a catheter, bougie, or any such instrument, and it often raises the sound over a

small stone in the bladder, so as to prevent its being felt." In such cases (he remarks) "I have frequently passed first a hollow elastic catheter till it has reached this point, and afterwards a stylet or brass wire properly curved so as to go over the prostate gland."

Hunter gives a very sound piece of advice in reference to the importance of surgeons instructing patients who are liable to urethral obstructions or to enforced retention of urine in the art of passing a catheter for themselves. He observes: "This practice of the patient under a surgeon's eye, by which he is taught how to pass them, becomes more necessary as strictures are diseases that commonly recur; and therefore no man who has ever had a stricture and is cured of it should rely on the cure as lasting, but should be always prepared for a return, and should always have some catheters with him. He should not go a journey, even of a week, without them, and the number should be according to the time he is to be absent, or to the place whither he is going, for in many parts of the world he cannot be supplied with them." No better counsel could be given than this. Now, however, it would not be regarded as complete without attaching instructions as to the necessity for employing scrupulous care in cleaning these instruments and rendering them innocuous, so far as this is possible, by the use of antiseptics.

In reference to the latter subject I cannot find that Hunter recognised, as possessing any striking peculiarities, what at the present day we are accustomed to speak of as urinary fever. It would be very interesting, Sir, if at your bidding we could hear from him his opinion as to its etiology. Which view would he take—the neurotic or the septic, or would he recognise both? It is a difficult question to determine, and much variety of opinion in reference to it prevails.

For my own part I cannot see how and where the nerve theory of causation comes in, though I fully recognise how largely the sexual apparatus is innervated and how sympathetic it is. I would ask what have been the results of the extension of the principles of antiseptics to the surgery of the urinary organs? What has followed the more stringent precautions that we as surgeons impose upon ourselves in all that applies to the use of instruments to these parts, and what happens commonly when we or our patients fail in giving the fullest effects to these antiseptic provisions? Have we thereby lessened or increased the number of cases which would come under the designation of urinary fever?

Again, how does it happen that the most frequent violent and fatal forms of urinary fever are associated with the smaller lesions and not with the larger? How insignificant must be the nerve damage which is occasioned by an internal urethrotomy or the passing of a sound or catheter as compared with that of a lateral lithotomy for the removal of a large calculus, as used to be practised. And yet after the latter we seldom, if ever, saw anything more than the febrile excitement which is usually associated with all wounds which are not protected by antiseptics.

Again, an unprotected internal urethrotomy wound is almost invariably followed by a rigor and some degree of urinary fever. Whereas if we considerably add to that lesion by a perineal section for the insertion of a drainage-tube into the bladder, no urinary fever follows if the latter acts perfectly.

Lastly, what has sterilisation of the urine done in reference to the liability to urinary fever? The late Dr. Palmer, of Louisville, whom I knew well, showed how, by sterilisation of the urine by administering boracic acid beforehand,

the liability to this fever was almost reduced to *nil* in the case of such operations as internal urethrotomy. By evidence of this kind the septic origin of urinary fever is, I believe, substantiated as against the nerve theory.

The question I have thus raised as to the etiology of so-called urinary fever is one of much importance, for if it is septic, as I believe it is, it should be amenable to precautionary antiseptics. For some time I have been acting on this principle. If I ever cause, either accidentally or designedly, a lesion of the male urethra, as by passing a sound or a catheter, or in performing an internal urethrotomy, I am in the habit of putting some antiseptic into the bladder immediately after, which would seem to have the power of temporarily sterilising the urine and rendering it less likely to infect the individual through any small lesion that may have been caused.

For instance, after an internal urethrotomy, on completing the operation I put into the empty bladder some ounces of boracic lotion, or of a solution of corrosive sublimate, the latter in the proportion of 1-6000, and leave it there. In this way I believe I have succeeded in averting the absorption by the wound of intensely poisonous compounds derived from the urine, probably of the nature of ptomaines, which indicate their presence in the system by the characteristic rigors and elevation of temperature with which, unfortunately, we are so familiar.

By following this local treatment up by the internal administration of certain drugs which more or less sterilise the urine, as in Dr. Palmer's experiments with boracic acid, the development of urinary fever in this class of operation may often be prevented.

The best sterilisers for this purpose are urotropine, benzoate, and salicylate of soda and borocitrate of magnesia. The last mentioned is the only digestible prepara-

tion of boracic acid I know of which can be given in sufficiently large doses to effect this purpose. Quinine and salol have a similar action, but they are not so well adapted as those mentioned.

We would do well if we paid more attention to the subject of urine sterilisation in its relation to the prevention and treatment of urinary fever, in connection more particularly with some of the minor operations on these parts. In some surgical works hardly any reference is made to this as a necessary part of the preparatory treatment of persons about to undergo operations involving these organs. Hence urinary fever and the complications arising out of it, such as suppression of urine, are far commoner than they should be.

It seems probable that these intensely poisonous compounds derivable from the urine are of a fixed and determined nature, though chemically we may not have been able to analyse them, and that the mere presence in the urine of other foreign agencies is capable of rendering them inert and inoperative. Hence may be explained the efficacy of the precautionary measure I have advocated. The whole subject, however, relative to this aspect of antiseptic surgery is worthy of a closer attention and application than it has hitherto received. I have merely touched the fringe of it in a practical form.

Hunter, when evidently speaking of the treatment of residual and retained urine in cases of enlarged prostate, makes a very pertinent observation. Referring as to how the urine may be evacuated in these circumstances he says : " There are three ways in which it can be done, one, by allowing the parts to do their own business as much as they can, and this at first sight might be supposed to be the very best ; but it is in some cases the very worst."

He gives prominence to the view, now as then enter-

tained, that there is some degree of positive risk connected with non-interference in cases of this kind, which may arise from persons carrying about with them constantly that which ought to be spontaneously evacuated. Where this can be done with impunity and where it is attended with more or less risk is sometimes a fine point to decide, but it is one that should always have our careful consideration.

No one, I am sure, would wish to introduce a patient to what is called catheter life—for life it usually is—prematurely, or without sufficient reason; but the necessity for the use of the catheter under certain conditions of bladder unrest and urinary change should not be overlooked or disregarded. States of exhaustion and sepsis may thus be imperceptibly impending.

Because an elderly man carries about constantly with him two or three ounces of normal urine is not sufficient reason why he should use a catheter. On the other hand, an ounce or so of decomposing urine contained within the bladder in some depression or sac may readily prove a source of infection, which should be removed and dealt with, for thus the whole amount of urine may be rendered offensive and poisonous.

A case in point may be briefly mentioned. Some time ago I saw a patient, aged 40, who was suffering from cystitis. A few months previously, when in excellent health, he was conscious of a sudden and violent muscular effort to avoid falling off a restive horse. He was not obviously hurt at the time, but was aware of something giving way about his bladder. Some weeks after he consulted me for frequent micturition and ammoniacal urine. There was no apparent cause for this. After many months' illness he died from cystitis and chronic nephritis.

From a *post-mortem* examination it was discovered that

he had a suppurating sacculus on the left side of the bladder, at the point he had complained of, which contained about an ounce of offensive urine. The communication with the bladder was very narrow. I have no doubt this was a hernial protrusion of the mucous coat of the bladder through the muscular, consequent on the great and sudden effort referred to. In this sac urine decomposed and led to a general infection of the urinary organs, which in the course of time proved fatal. It might have been possible to have averted this had the presence of the sac and its relation with the bladder been determined. That this occasionally happens more gradually in the course of prostatic obstruction with residual urine there can be no doubt.

Thus can it happen, as Hunter states, that non-interference with a residuum of urine in the bladder, whether accidentally or naturally brought about, may prove "the very worst" instead of the very best practice.

It may not be out of place to notice here that residual urine is occasionally met with in early adult life as well as in male children, and it is in such circumstances that we are apt to forget its possible presence and influence. In the former it may be due to some temporary arrest of the function of micturition, as by a previous prostatic abscess, for instance, as I am not now referring to residual urine in connection with persons who are either obviously ataxic or strictured. In this way various irregular symptoms not unlike poisoning may be produced, which do not cease until the bladder cause is made out, and the storage of the urine, as well as its composition, placed upon a more satisfactory basis. I am thinking of cases, of which I have seen a few, where such symptoms as periodical vomitings, purgings, and anomalous complaints connected with the skin and innervation, almost suggestive

of ataxia, were unexplainable before the bladder condition was made out and dealt with, when these symptoms ceased.

Then, again, though the term is hardly appropriate, to what mere spasm causes the nocturnal incontinence of male children may sometimes be explained by their going to bed with the bladder containing a considerable amount of urine when it was thought to be emptied. In several instances it has happened that the passing of a small, soft rubber catheter at bedtime and removing what the bladder contained, sometimes an ounce or so, has speedily been the means of effecting a cure. I do not, however, undervalue the moral effect of this treatment in some of these cases.

Amongst the many subjects that Hunter occupied himself with were the periodical changes which took place in the sexual glands of birds and certain mammals. In some observations on the function of the prostate gland in man and the lower animals, Mr. Joseph Griffiths, of Cambridge, quotes the following from Hunter's works: "The prostate and Cowper's glands and those of the urethra in the perfect male (bull) are soft and bulky. In the castrated animal (bullock) these are small, flabby, tough and ligamentous, and have little secretion. Especially marked is the change when the animal is castrated when young."[1]

Passing from these observations, I will proceed to notice some points connected with the surgery of this part. I do not think there can be any doubt that there are various states of obstruction arising out of prostatic hypertrophy where it is impossible to give adequate relief to the patient by the use of the catheter, however skilfully it may be employed. Further, there are instances where persons,

---

[1] *Journal of Anatomy and Physiology*, vol. xxiv.

either from sentiment or more cogent reasons, are willing to incur some degree of risk to their lives to escape the annoyance of catheter dependence.

For many years it has been laid down as a guiding principle, that persons so situated by reason of an obstructing prostate should be content with their lot so long as the process can be carried on with a reasonable amount of ease and satisfaction to themselves. This principle seems to have been arrived at on the following grounds: First, because catheter dependence is not inconsistent with the maintenance of good health and the attainment of an average existence, or even a life considerably exceeding this limit; and secondly, because the removal of more or less of the prostate did not necessarily mean that normal micturition would in all cases be permanently restored.

Evidence seems to be accumulating to indicate that prostatectomy may be practised with greater safety and certainty than it was formerly. This is due, partly to improved methods of operating and partly to our recognising more fully the varieties of form and structure the hypertrophied prostate presents. Our desire to discover some uniform method of treatment appeared to retard the surgery of this part, for I have little doubt that Dr. William White's important suggestions and practice relative to the induction artificially of shrinkage of the prostate tended in some measure to draw our attention from Mr. McGill's work long before we had acquainted ourselves with all its merits and were sufficiently informed as to its limitations.

It would be premature at present to draw conclusions from figures relative to the more recent developments of prostatectomy. Taking, however, cases where the enlargement is mainly due to what may be spoken of as enucle-

able adenomas,[1] which by their early and somewhat rapid development appear to have squeezed out of existence, even to the limits of the fibrous capsule, the original prostatic tissue, the mortality is not large.

Fuller[2] writes: "The mortality attached to prostatectomy is at the present time (1900) in the neighbourhood of 15 to 18 per cent. If one operated simply on selected cases it ought to be much less."

My colleague, Mr. P. J. Freyer[3] has recently published the results of eight cases, with one death at the end of three weeks. These cases are of much interest and importance, and have undoubtedly given a fresh impulse to enucleation in connection with suprapubic prostatectomy.

Mr. H. L. Barnard[4] has recorded two cases, both successful; whilst from my own practice during the past year I can mention five cases without a death, as yet unpublished, and in the practice of some of my colleagues five other cases, also unpublished, without mortality and with excellent results.[5]

Within my own knowledge, therefore, I can bring forward a series of twenty-one cases in which this operation has been performed with only one fatality. It is hardly fair, perhaps, to take such a limited number of cases as the basis of a statistical statement, but it will be seen that

---

[1] "A Case of Lithotomy where a Portion of the Prostate (adenoma) was also successfully Removed," by Reginald Harrison. *Trans. Royal Med.-Chir. Society*, 1882.

[2] "Diseases of the Genito-Urinary System." Pp. 412. Macmillan and Co., New York and London. 1900.

[3] *Brit. Med. Journal*, July 20, 1901, and February 1, 1902.

[4] *The Lancet*, 1901.

[5] Sir William MacCormac had a very successful case shortly before his lamented death, where a large adenoma was thus removed together with numerous calculi. The specimen is in the Museum of the Royal College of Surgeons.

far from Fuller's mortality of 15 to 18 per cent. being reached, the mortality in this series only totals 5 per cent. Even the last figure is capable, I believe, of a further reduction by utilising the less formidable process of urethral prostatectomy as will first be illustrated, or by substituting perineal tubing with control drainage[1] in cases physically or otherwise unfitted for vesical prostatectomy.

Nor should I omit to mention a paper published by Mr. Mayo Robson,[2] which included twelve cases of prostatectomy with one death. From a different standpoint, Professor Albarran,[3] of Paris, recently records sixteen cases of perineal prostatectomy which he had completed without a death. The operative prospect from all sides may therefore be regarded as favourable.

Viewing these figures as a basis representing the results of prostatectomy, and comparing them with what happens to persons leading a catheter life, I am inclined to think they favour the former rather than the latter. Take, for instance, the man who has to catheterise himself one thousand times or more in the year; what is his expectation of life as compared with the individual who incurs the risk of a prostatectomy and has, after a successful operation, no further need for this instrument? I am disposed to think, from a long observation and knowledge of persons habitually using and dependent upon catheters, that they eventually succumb to one or other of the casualties incidental to this form of instrumentation.

Then, again, our views relative to the paralysed or atonic bladder associated with the hypertrophied prostate

---

[1] *Polyclinic and Medical Graduates' Journal*, November, 1901. Bale, London.

[2] *Brit. Med. Journal*, vol. ii., 1894.

[3] *Trans. Association Française d' Urologie*, Paris, 1901.

certainly require remodelling under the light that prostatectomy has thrown. There can be no doubt that after this operation persons have completely recovered natural bladder power after its suspension from one to seven years. The possibility of this has been doubted and more than once publicly challenged. A reference to such records as I have mentioned is sufficient, however, to support this statement.

Time will not permit me to speak of the relationship which Hunter was the first to point out, that existed between the testes and the prostate, and to offer some remarks on the employment of vasectomy in connection with some forms of urinary disorder. I refer more particularly to the influence this operation may exercise in preventing and arresting prostatic enlargement in a very simple manner. And further, in interrupting the extension of inflammations and other microbic conditions from above downwards and *vice versâ*. These observations have already been placed before the profession and are utilised in practice. I will therefore pass on to notice the application of prostatectomy to some cases of enlarged prostate complicated with vesical stone.

As matters at present stand, there can be no question that in the case of stone in the bladder happening in young children and adults before the prostatic age is reached, its removal should be effected by crushing, save under exceptional circumstances. When, however, the period is reached when prostatic hypertrophy may be the cause or the complication of a bladder stone, the liability to recurrence after removal by crushing becomes exceedingly frequent, and has to be taken into consideration.

In earlier days my practice, so far as the operative treatment of stone was concerned, included a considerable number of young male children, and I remember tabulat-

ing a large number of lateral lithotomy cases, in these subjects, with a record of "no deaths and no recurrences."

More recently I published a paper[1] which included an analysis of 110 persons I operated upon for stone in the bladder during the years 1890-97. This comprised 101 litholapaxies, 3 perineal lithotrities, 2 suprapubic lithotomies, and 4 median lithotomies. Of the 101 litholapaxies, or crushing operations, though the mortality was only a fraction over 5 per cent., 23 of the patients were known to have one or more recurrences, for which I treated them on subsequent occasions. These occurred for the most part in persons of an advanced age with enlarged prostates, who were more or less dependent on their catheters and possessed but little power of voluntary expulsion. Thus by trapping gravel and concealing fragments of grit, prostatic hypertrophy considerably adds to the liability to vesical stone and its recurrence in the latter portion of male life.

For reasons of this kind many surgeons have considerably restricted the use of litholapaxy, and have substituted for it suprapubic cystotomy. Writing to me recently on this subject, and in view of a reduced mortality after the latter operation, Mr. Cadge states: "I should, were I still in active practice, do abdominal cystotomy, not only for large stones, but for cases in which the stone is of moderate or small size, the patient depending wholly on the catheter, the prostate large and the bladder misshapen or pouched; for cases, in short, which constitute the large proportion of recurrences." The more recent developments in prostatectomy will, I think, add considerably to the force of Mr. Cadge's remarks.

---

[1] "A Further Contribution to the Surgery of Stone in the Bladder" (*op. cit.*).

In persons suffering from much enlargement of the prostate and catheter dependence, complicated with stone in the bladder, after litholapaxy has failed once or perhaps twice, to prevent recurrence of the latter, suprapubic cystotomy will have still further claims for consideration, not only because it permits of the removal at one operation of the stone, but a contributing cause of it, as well as the catheter dependence, which so frequently co-exists or arises under these circumstances. I will proceed to illustrate the employment of prostatectomy by the narration of a few cases, and to show what was thus removed.

CASE 1.—The following case may be taken as illustrating—not any difficulty connected with the removal of stone from the bladder by crushing or litholapaxy—but two conditions favourable to the formation and recurrence from time to time of phosphatic stone when an enlargement of the prostate is present. These were (1) the necessity existing for the permanent use of the catheter which implied the suspension of the voluntary power of urine-expulsion and whatever else the bladder contained; and (2) a specially foul state of the residual urine which co-existed and supplied a material for stone formation. The case further illustrates how the removal of the obstruction thus caused by the prostate ended these two conditions.

A professional man, aged 55, seen with Sir R. Douglas Powell, in April, 1899, with symptoms of stone in the bladder for which he was sounded. A stone was felt lying behind a prominent prostate. I removed the former by litholapaxy, the fragments weighing 296 grains of oxalate and phosphatic stone. The patient, previous to the operation, had been largely dependent on his catheter for a year and it was hoped that the removal of the

calculus would be followed by a return of natural power. This, however, was not the case, though in other respects he made a rapid recovery after the operation. A recurrence in the form of a phosphatic stone took place and he was again operated upon in August of the same year by litholapaxy. A second recurrence occurred later on and a stone was removed in a similar manner in September, 1900.

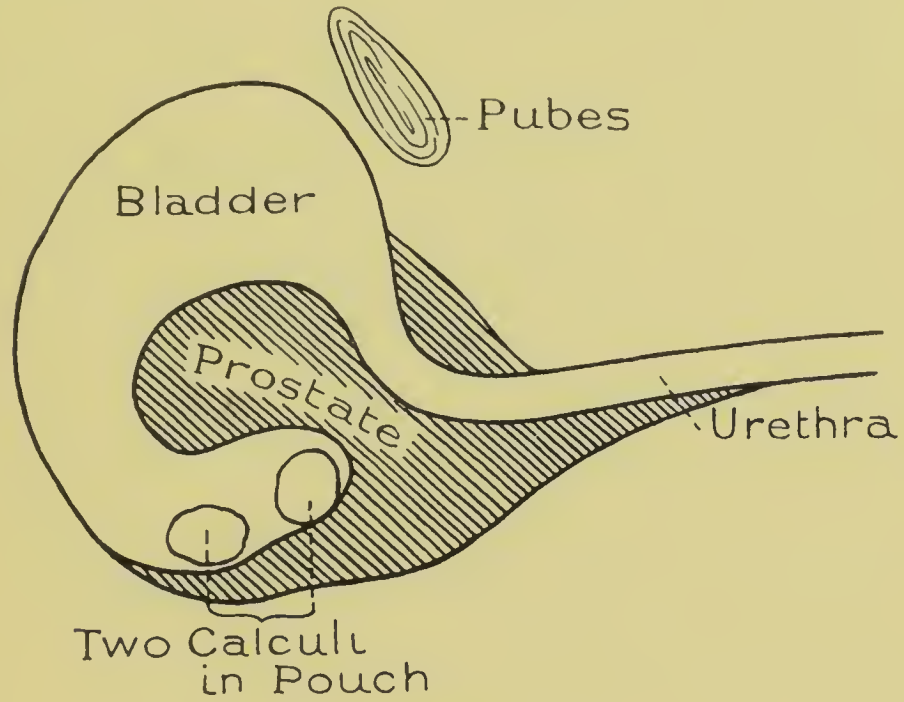

FIG. 4.

Early in 1901 he had further symptoms of stone and it appeared clear that the only way of preventing these recurrences and restoring the natural function of micturition, was to remove the obstructing portion of prostate. A careful examination was made by the cystoscope and I recognised the conditions outlined in the drawing (fig. 4). It will be seen that two stones were covered by an overhanging middle lobe, with a narrow or stalk-

like pedicle. Thus both gravel and urine were trapped. Guided by some previous experience of a similar kind I recognised that this form of prostatic obstruction could be completely removed without opening the bladder. An important point.

I therefore punctured the deep urethra on a grooved staff as for a median lithotomy and introduced my finger into the bladder. Having thus made my way I substituted a pair of polypus forceps, and seizing the neck of the growth twisted off the excrescence as figured and

Fig. 5.

afterwards withdrew the two stones which are delineated beneath it (fig. 5). A drainage-tube was introduced into the bladder and retained for a few days, on the withdrawal of which the small wound speedily healed. He left the surgical home on the fourteenth day.

He has never used a catheter since nor has he had any further recurrence of stone. He had been dependent on his catheter for over three years, and never hoped, after

what he had been told, to dispense with it. How far this form of prostatectomy succeeded may be gathered from my examination of his bladder a year after this operation His urine was perfectly normal and he had no residual.

The growth proved to be a pendulous adenoma, and no further enlargement is likely to take place. The case shows the importance of recognising those prostatic enlargements, which can be dealt with without submitting the patient to a more extended operation. Mr. J. G. Pardoe assisted me, and Mr. Carter Braine gave the anæsthetic on these occasions.

CASE 2.—Male, aged 79. Seen with Dr. J. G. Glover. In 1897 I removed a small stone from his bladder by litholapaxy. His prostate was then considerably enlarged, and he was entirely dependent upon his catheter. Attacks of cystitis were frequent, and the difficulty connected with the use of his instrument was constantly increasing. When I saw him again in consultation in 1901, his condition was about as bad as could be imagined, and his life most miserable. I advised suprapubic prostatectomy, which was done at once. Mr. Pardoe assisted me, and Mr. W. Braine administered the anæsthetic. The operation was a difficult one, as the enlargement consisted of a prostate far advanced in fibrous degeneration, and but little of it was enucleable by the finger. However, a considerable mass was removed, partly by finger and forceps, and in addition the five stones, also figured below, weighing 3 drs., which were completely concealed by overhanging growths (fig. 6). The patient did remarkably well, and twenty-one days after the operation passed 40 oz. of urine naturally in twenty-four hours. He left the home at the end of four weeks, and shortly after went to Bournemouth.

His health is completely restored, and he is again leading an active life. The case is a remarkable instance of

how completely a person, even at this advanced age, can recover the normal power and function of the bladder. After seven years catheter dependence, he has been able

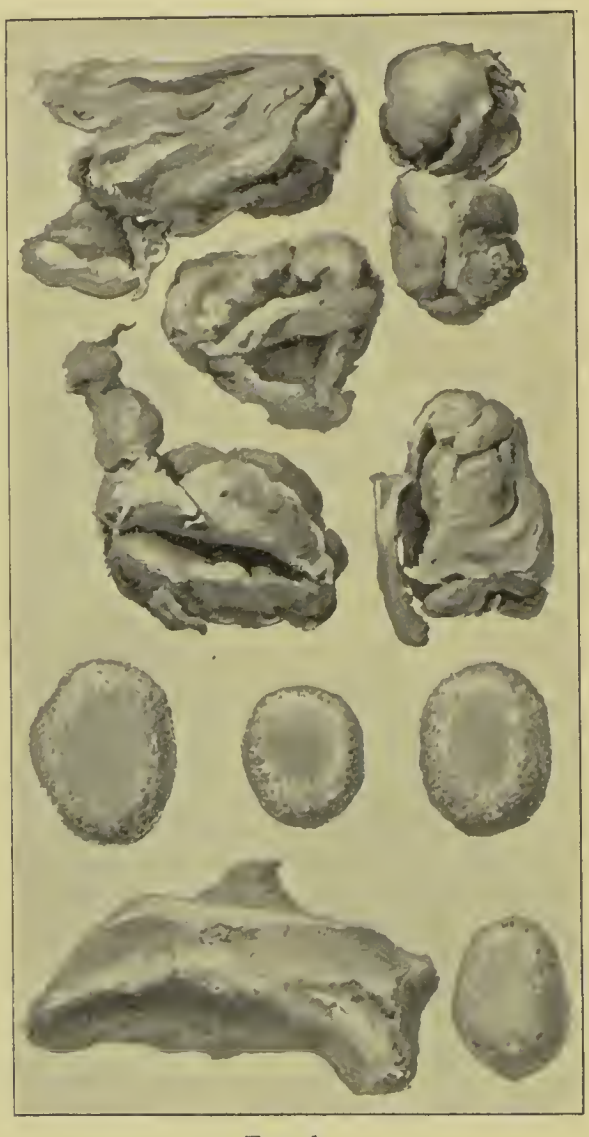

FIG. 6.

to entirely dispense with this instrument, and to exercise full control over urination.

CASE 3.—Male, aged 60. When I first saw him in July, 1899, he was then dependent on the catheter and had been

so since 1897, from enlargement of the prostate, which could be distinctly felt from the rectum. In addition he was greatly troubled by incontinence of urine at night, in spite of the use of the catheter. About this time on my advice he had vasectomy performed, which had the effect of removing the latter symptom.

In 1901 I again saw him, for the reason that he complained much of the frequent passing of the catheter, which greatly disturbed his rest and sleep both by day and night. The use of the instrument had become intolerable to him,

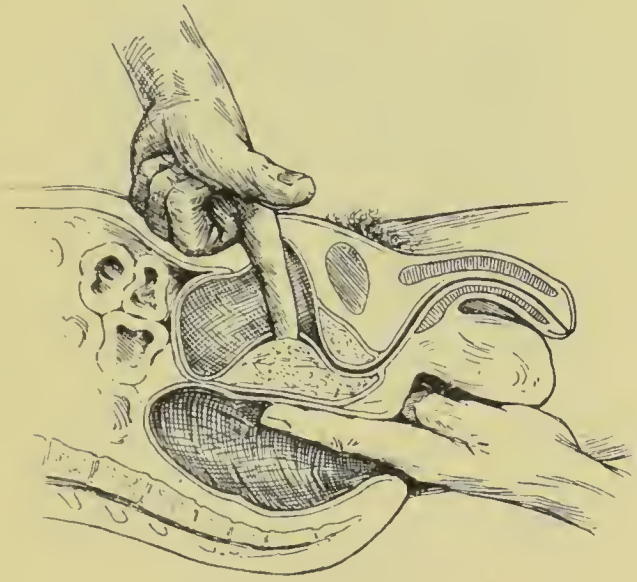

Fig. 7.

and he was prepared to take any reasonable risk to dispense with it. In every other respect he was in robust health, but his catheter dependence, he said, entirely spoilt his life. Later on I examined him with the cystoscope, when, in addition to a large prostate, a stone was seen partially concealed by it.

As the condition seemed a favourable one for removing both the enlargement caused by the prostate and the

additional irritation excited by the stone, I advised prostatectomy. The patient was extremely anxious that this course should be carried out.

Suprapubic prostatectomy was accordingly performed in November, 1901, when the tumour was enucleated in the manner figured by Fuller (fig. 7). The original drawing has been somewhat altered so as to show how the

Fig. 8.

use of a finger in the rectum may materially facilitate enucleation. I have found a metal lever placed in the bowel of much assistance in this operation. A drainage-tube was inserted by the suprapubic wound. The prostatic tumour (fig. 8) weighed 3 oz. and proved to be an adenoma.

The stone was composed of uric acid and weighed 50

grains. I was assisted by Mr. J. Pardoe, and Mr. Carter Braine gave the anæsthetic. The patient made an uninterrupted recovery, and left the home in a month, passing urine normally. In this instance the patient, a professional man, had been entirely dependent on his catheter for four years. He greatly appreciated his return to a normal state of things, and had quite prepared himself to take some degree of risk to bring this about.

CASE 4.—A retired medical man, aged 61, consulted me in April, 1901, for frequency of micturition due to an enlarged prostate. He had not commenced to use the catheter, but he was advised that this might be necessary. Early in January, 1902, he again saw me. He had tried the catheter, and though it gave him temporary relief he was anxious to submit to any process of treatment which might avert its constant use. In fact, to use his own words, he declared that he would sooner die than submit to lead a life where catheter dependence was a necessary condition. Examination with the cystoscope, and the catheter, showed that the prostate was enlarged, the bladder unemptied by natural efforts, and the conditions favourable for suprapubic prostatectomy.

The operation was accordingly performed on January 5. A large and much adherent fibro-adenoma was removed in two pieces, entirely by the finger. The mass taken away weighed $1\frac{3}{4}$ oz. Back pressure was marked, as the vesical orifices of each ureter admitted the tip of the forefinger. There was no stone found. Mr. W. Braine gave the anæsthetic and Mr. J. Pardoe assisted me.

The patient came to see me at my house on February 20, six and a half weeks after the operation. His condition was as follows: Has no occasion for the catheter, passes his urine in a good stream and can retain it from five to six hours. It is normal in quality and quantity, and

he has full control over his bladder. His desire to be freed from a catheter dependence has thus been realised.

CASE 5.—Man, aged 67, with greatly enlarged prostate and catheter dependence. He first came under notice in 1899, when I performed vasectomy for him in St. Peter's Hospital. This was followed by some relief in enabling him to pass about half his urine naturally. Later on he became quite dependent on the catheter, which had to

FIG. 9

be used with great frequency, preventing him obtaining sufficient continuous sleep. The low specific gravity of the urine indicated that back pressure and damage to the kidneys were imminent. He was extremely anxious to get rid of the annoyance of catheter dependence, as it greatly interfered with his occupation.

I performed suprapubic prostatectomy at the hospital on February 5, 1902. Two large adenomas corresponding

with the lateral lobes were removed (fig. 9). The patient has continued to make good progress, and though the suprapubic incision has not up to this date (February 24) completely healed, he passes a considerable proportion of his urine naturally and has no need of a catheter.

The enucleation of the adenomas was carried out as shown in fig. 7, the mucous membrane of the projecting prostate being divided with scissors so as to give access within the capsule to the tip of the forefinger. There was no stone. The masses removed were true adenomas, with the urethra running between them.

Though the results of prostatectomy, as now being practised, are very encouraging, it must be remembered that instances of carcinoma of the prostate are liable to be submitted to this process. The diagnosis between a hard, fibrous prostate and a cancerous one belonging to the malignant type is not always easy to make during life. Nor, as a distinguished microscopist once said to me, can this point invariably be readily determined even after death, except from a clinical point of view. Yet the supposed rarity of cancer in this part must not be relied upon too much. I have already met with one instance in my practice, not sufficiently advanced for publication, where a carcinoma has been removed in these circumstances. So far the case has done well and relief has been given, but what about the future?

In these remarks, which I must now bring to a close, I have endeavoured, though very imperfectly, to illustrate by a few examples the influence that one man, in the person of John Hunter (who has now been dead over a hundred years), exercised on the development and progress of practical surgery. At no period in the history of surgery has this influence been greater or more conspicuous than at present.

The public and the profession owe a deep debt of gratitude to a Society like this, which devotes so much attention and attaches so great importance to all that relates to the life and work of John Hunter.